

REMARKS

The forgoing amendment amends claims 1, 3, 5, 9, 13, 15 and 17-19, and cancels claim 2. Now pending in the application are claims 1 and 3-19, of which claims 1, 3, 9, 13 and 15 are independent.

I. Telephone interview and Claim Amendments

Applicants thank the Examiner for the courtesy of a telephone interview conducted on September 19, 2007. During the interview, Applicants explained the present application to the Examiner with reference to Figures 1, 3 and 5. Applicants argued to the Examiner that the cited references do not disclose or suggest providing a signal pressure pipe (claim 3), flow-in pipe (claim 9), flow-in pipe and flow-out pipe (claim 13), and ventilation pipe (claim 15) between the coolant liquid storage container and the supply air pipe.

In response, the Examiner noted that the limitations for those elements are unclear in the claims. The Examiner requested that Applicants amend the claims to specifically claim, for example, that the signal pressure pipe of claim 3 communicates with the coolant liquid storage container and the supply air pipe to direct the hydrogen gas in the coolant liquid storage container to the supply air pipe.

Applicants also discussed the §112 rejections of claims 17-19. Applicants proposed to amend claims 17-19 using the language “configured to.” The Examiner noted that such an amendment may overcome the §112 rejections.

Applicants further discussed the rejection of the method claims. Applicants proposed to amend claim 1 to incorporate the subject matter of claim 2, which is consistent with the Examiner’s request regarding the apparatus claims.

Based on the discussion with the Examiner, Applicants amend claims 1, 3, 9, 13, 15 and 17-19, and cancels claim 2. Support for the claim amendments can be found throughout the original figures and corresponding descriptions in the specification. No new matter is added.

II. Summary of Rejections

Claims 5 and 17-19 are rejected under 35 U.S.C. §112, second paragraph as being indefinite.

Claims 1-2 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Application Publication No. 2001/0019789 (“Hirakata”) in view of U.S. Patent Application Publication No. 2002/0189873 (“Mizuno”).

Claim 2 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hirakata in view of Mizuno and further in view of U.S. Patent Application Publication No. 2003/0224226 (“Jia”).

Claims 3-6, 8-12 and 15-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirakata in view of Mizuno.

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hirakata in view of Mizuno, and further in view of U.S. Patent No. 4,923,768 (“Kaneko”).

Claim 13-14 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hirakata in view of Mizuno, and further in view of Jia.

The rejections will be discussed separately below.

III. Claim Rejections under 35 U.S.C. §112

Claims 5 and 17-19 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. (Office Action, page 2).

The Examiner note that “[t]he claims are drawn to a product and have methods of operating or using the product.” (Office Action, page 3). Applicants amend claims 5 and 17-19 to address the Examiner’s concern. As such, Applicants respectfully request withdrawal of the 35 U.S.C. §112, second paragraph rejections of claims 5 and 17-19.

IV. Rejections of Claims 1-2 under 35 U.S.C. §103

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirakata in view of Mizuno. (Office Action, page 4). Applicants respectfully traverse this rejection.

Applicants submit that Hirakata and Mizuno do not disclose or “suggest introducing the mixed gas to a cathode of the fuel cell,” as recited in claim 1.

The Hirakata reference discloses that the hydrogen gas leaking into the cooling water is collected in the upper tank (12) or the reserve tank (24) where the gas detectors are mounted. If the hydrogen sensors detect the hydrogen collected in the upper tank (12) or the reserve tank (24), the hydrogen leakage warning lamp (92) informs the driver of the leakage. The Hirakata reference, however, does not disclose or suggest that a mixed gas is introduced to the cathode of a fuel cell, as required by claim 1.

The Mizuno reference discloses a hydrogen dilutor (424) that receives the hydrogen gas discharged from the fuel cell. The Mizuno reference also discloses that the hydrogen dilutor (424) receives the oxygen off-gas discharged from the fuel cell. The hydrogen dilutor (424) dilutes the discharged hydrogen gas by mixing the hydrogen gas and the oxygen off-gas. The diluted hydrogen gas is introduced into the oxygen off-gas discharging channel (503). The Mizuno reference, however, does not disclose or suggest that the mixed gas is introduced to the cathode of a fuel cell, as required by claim 1.

As such, Applicants submit that Hirakata and Mizuno fail to disclose or suggest all of the limitations of claim 1. Claim 2 is canceled. Applicants respectfully request withdrawal of the above 35 U.S.C. 103(a) rejection of claims 1-2.

V. Rejection of Claim 2 under 35 U.S.C. §103

Claim 2 is canceled. As such, the rejection of claim 2 is moot. Applicants therefore request withdrawal of the rejection of claim 2.

VI. Claim Rejections under 35 U.S.C. §103

Claims 3-6, 8-12 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirakata in view of Mizuno. (Office Action, page 7). Applicants respectfully traverse this rejection.

A. Claim 3

Applicants respectfully submit that Hirakata and Mizuno do not disclose or suggest “said signal pressure pipe communicates with said coolant liquid storage container and said supply air pipe to direct the hydrogen gas in said coolant liquid storage container to said supply air pipe,” as recited in claim 3.

As discussed above, the Hirakata reference discloses the collection of the hydrogen gas from the cooling water while the Mizuno reference discloses a hydrogen dilutor. The hydrogen dilutor of the Mizuno reference mixes the hydrogen gas discharged from a fuel cell with the oxygen off-gas that is also discharged from the fuel cell, and introduces the mixed gas into the oxygen off-gas discharging channel. The combination of the Hirakata and Mizuno references does not disclose or suggest a signal pressure pipe that communicates with the coolant liquid storage container and the supply air pipe to direct the hydrogen gas in the coolant liquid storage container to the supply air pipe, as recited in claim 3. The signal pressure pipe recited in claim 3 enables the hydrogen gas collected from the coolant to be supplied to the cathode of a fuel cell. The cited Hirakata and Mizuno references do not disclose or suggest any pipe that connects the coolant liquid storage container to the supply air pipe.

For reasons set forth above, Applicants submit that Hirakata and Mizuno fail to disclose or suggest all of the limitations of claim 3. Applicants respectfully request withdrawal of the 35 U.S.C. 103(a) rejection of claim 3.

B. Claims 4-6

Claims 4-6 depend from claim 3 and, as such, incorporate the patentable features of claim 3. Applicants therefore request withdrawal of the 35 U.S.C. 103(a) rejection of claims 4-6.

C. Claim 9

Applicants submit that Hirakata and Mizuno do not disclose or suggest “said flow-in pipe communicates with said coolant liquid storage container and said supply air pipe to direct the mixed gas in said gas phase portion of said coolant liquid storage container to said supply air pipe,” as recited in claim 9.

As discussed above, the Hirakata reference discloses the collection of the hydrogen gas from the cooling water while the Mizuno reference discloses a hydrogen dilutor. The hydrogen dilutor of the Mizuno reference mixes the hydrogen gas discharged from a fuel cell with the oxygen off-gas that is also discharged from the fuel cell, and introduces the mixed gas into the oxygen off-gas discharging channel. The combination of the Hirakata and Mizuno references does not disclose or suggest *a flow-in pipe that communicates with the coolant liquid storage container and said supply air pipe to direct the mixed gas in the gas phase portion of the coolant liquid storage container to the supply air pipe*, as recited in claim 9. The flow-in pipe recited in claim 9 enables the hydrogen gas collected from the coolant to be supplied to the cathode of a fuel cell. The cited Hirakata and Mizuno references do not disclose or suggest any pipe that connects the coolant liquid storage container to the supply air pipe.

For reasons set forth above, Applicants submit that Hirakata and Mizuno fail to disclose or suggest all of the limitations of claim 9. Applicants therefore request withdrawal of the rejection of claim 9.

D. Claims 10-12

Claims 10-12 depend from claim 9 and, as such, incorporate the patentable features of claim 9. Applicants therefore request withdrawal of the rejection of claims 10-12.

E. Claim 15

Applicants submit that Hirakata and Mizuno do not disclose or suggest “said ventilation pipe communicates with said coolant liquid storage container and said air pipe to direct the air in said air pipe to said coolant liquid storage container,” as recited in claim 15.

As discussed above, the Hirakata reference discloses the collection of the hydrogen gas from the cooling water while the Mizuno reference discloses a hydrogen dilutor. The hydrogen dilutor of the Mizuno reference mixes the hydrogen gas discharged from a fuel cell with the oxygen off-gas that is also discharged from the fuel cell, and introduces the mixed gas into the oxygen off-gas discharging channel. The combination of the Hirakata and Mizuno references does not disclose or suggest a ventilation pipe that communicates with the coolant liquid storage container and the air pipe to direct the air in the air pipe to the coolant liquid storage container, as recited in claim 15. The air pipe supplies air to the fuel cell, so the ventilation pipe recited in claim 9 enables air in the air pipe to be supplied to the coolant liquid storage container to the coolant liquid storage container. The cited Hirakata and Mizuno references do not disclose or suggest any pipe that connects the coolant liquid storage container to the air pipe.

For reasons set forth above, Applicants submit that Hirakata and Mizuno fail to disclose or suggest all of the limitations of claim 15. Applicants therefore request withdrawal of the rejection of claim 15.

F. Claims 16-19

Claims 16-19 depend from claim 15 and, as such, incorporate the patentable features of claim 15. Applicants therefore request withdrawal of the rejection of claims 16-19.

VII. Rejection of Claim 7 under 35 U.S.C. §103

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over Hirakata in view of Mizuno, and further in view of Kaneko. (Office Action, page 11). Applicants respectfully traverse this rejection.

Claim 7 depends from claim 3 and, as such, incorporates the subject matter of claim 3. As discussed above, Applicants respectfully submit that Hirakata, Mizuno and Kaneko do not disclose or suggest “said signal pressure pipe communicates with said coolant liquid storage container and said supply air pipe to direct the hydrogen gas in said coolant liquid storage container to said supply air pipe,” as recited in claim 3. Kaneko discloses a compressor to raise the reaction air pressure to be supplied to a fuel cell. Kaneko, however, does not disclose or suggest a signal pressure pipe that communicates with the coolant liquid storage container and

directs the hydrogen gas in the coolant liquid storage container to the supply air pipe, as recited in claim 3. The combination of the cited Hirakata, Mizuno and Kaneko references does not disclose or suggest any pipe that connects the coolant liquid storage container to the supply air pipe.

For reasons set forth above, Applicants submit that Hirakata, Mizuno and Kaneko fail to disclose or suggest all of the limitations of claim 3. Claim 7, which depends from claim 3, is not rendered obvious over the cited references. Applicants therefore request withdrawal of the 35 U.S.C. 103(a) rejection of claim 7.

VIII. Rejections of Claims 13-14 under 35 USC §103

Claims 13-14 are rejected under 35 USC 103(a) as being unpatentable over Hirakata in view of Mizuno and further in view of Jia. (Office Action, page 12). Applicants respectfully traverse the rejection.

A. Claim 13

Applicants respectfully submit that Hirakata, Mizuno and Jia do not disclose or suggest “said flow-in pipe and said flow-out pipe communicating with said cooling liquid storage container and said supply air pipe so that said flow-in pipe directs the air in said supply air pipe to said cooling liquid storage container and said flow-out pipe directs the mixed gas in said cooling liquid storage container to said supply air pipe,” as recited in claim 13.

As discussed above, the Hirakata reference discloses the collection of the hydrogen gas from the cooling water while the Mizuno reference discloses a hydrogen dilutor. The hydrogen dilutor of the Mizuno reference mixes the hydrogen gas discharged from a fuel cell with the oxygen off-gas that is also discharged from the fuel cell, and introduces the mixed gas into the oxygen off-gas discharging channel. The combination of the Hirakata and Mizuno references does not disclose or suggest a flow-in pipe and a flow-out pipe that communicate with the cooling liquid storage container and the supply air pipe so that the flow-in pipe directs the air in the supply air pipe to the cooling liquid storage container and the flow-out pipe directs the mixed gas in the cooling liquid storage container to the supply air pipe, as recited in claim 9.

The Jia reference discloses a controller that controls the oxidant shutoff valve, the fuel shutoff valve, and fuel conditioning valve to provide hydrogen directly to the cathode. (Jia, paragraph 21). The Jia reference, however, does not disclose or suggest a flow-in pipe and a flow-out pipe that communicate with the cooling liquid storage container and the supply air pipe so that the flow-in pipe directs the air in the supply air pipe to the cooling liquid storage container and the flow-out pipe directs the mixed gas in the cooling liquid storage container to the supply air pipe, as recited in claim 9. The combination of the cited Hirakata, Mizuno and Jia references does not disclose or suggest any pipes that connect the coolant liquid storage container to the supply air pipe.

For reasons set forth above, Applicants submit that Hirakata, Mizuno and Jia fail to disclose or suggest all of the limitations of claim 13. Applicants therefore request withdrawal of the rejection of claim 13.

B. Claim 14

Claim 14 depends from claim 15 and, as such, incorporates the patentable features of claim 13. Applicants therefore request withdrawal of the rejection of claim 14.

IX. Conclusion

In view of the above amendment, applicant believes the pending application is in condition for allowance.

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